Intelligent Monitoring Method for Backstage Data Security of Tourism Information Promotion Platform Based on Cloud Computing

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Abstract. Due to the rapid update of information platform unsafe factors, the monitoring ability and response effect of the monitoring platform of tourism information promotion platform are not high. The monitoring center of the platform is the data acquisition module, and the data acquisition module uses RTL8019AS controller to collect the data transmitted by the nodes and the data of the security status of the nodes. The processing module uses MSP430 processor to monitor the security of the measured data, and connects with the transmission module directly, so as to monitor the error of the processed data and transmit the data. Finally, the experimental results show that the background data security intelligent monitoring method of tourism information promotion platform based on cloud computing has strong monitoring ability and good response.

Keywords: Cloud computing · Tourism · Information promotion · Background monitoring

1 Introduction

In order to avoid the problems of low efficiency and unsafe operation of information monitoring of tourism information promotion platform, and improve the monitoring ability and response effect of the platform, an intelligent data security monitoring method based on cloud computing is proposed [1]. It focuses on the combination of RTL8019AS controller and MSP430 processor to monitor the tested data. The innovation lies in optimizing the error monitoring and data transmission mode of the tested data, reducing the unsafe factors of the information platform, striving for better monitoring ability and response ability, and ensuring the monitoring security of the tourism information promotion platform.

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2 Intelligent Monitoring Method for Backstage Data Security of Tourism Information Promotion Platform

2.1 Optimization of Functional Structure of Backstage Intelligent Monitoring Platform for Data Security of Tourism Information Promotion Platform

The monitoring safety monitoring platform of tourism information promotion platform has designed data collection module, processing module and transmission module. The data collection module is the monitoring center of the monitoring safety monitoring platform of the tourism information promotion platform, which is responsible for the collection of monitoring data of the tourism information promotion platform, including node transmission data and monitoring node safety status data [2–5]. In the process of intelligent monitoring of backstage data security of the platform, it is necessary to ensure the real-time monitoring of tourism information promotion platform and prevent the platform effect caused by monitoring data interruption [6–10].

Based on the above factors, the functional structure of the backstage data security intelligent monitoring platform of the tourism information promotion platform is optimized, and the RTL8019AS controller is added to the connection bus between the tourism information promotion platform and the data security intelligent monitoring platform. RTL8019AS controller has the functions of on-demand, monitoring indication and early warning, 16 kB synchronous dynamic random access memory and RTL8019 kernel, which are compatible with all kinds of collection algorithms and external circuits to ensure the real-time monitoring of tourism information promotion platform, so as to realize the high-speed and accurate collection of the data transmitted by nodes and the safe state of nodes. The warning device is equipped with a small LED display, which can emit prominent yellow light in the process of alarming, and display and check the background data parameters of the tourism information promotion platform that have not been successfully collected, so as to facilitate the intervention of platform maintenance personnel until the data collection is successful [10, 11]. The data after acquisition is successfully transferred to synchronous dynamic random access memory. PCI9054 is selected to be responsible for the connection with PC bus and signal monitoring. CPLD is used as the interface to complete the interface conversion between 32bit PCI bus and 8-bit data processing unit FPGA [7–9, 12, 13]. FPGA will write 16-by-8 bit data information into SLM or read the data from CCD into FPGA for decoding after coding. The selected CPLD is a complex programmable logic device CPLDEMP3256AQC20B-10 chip of Altera Company. Based on this, the configuration of the data monitoring platform is optimized, and the specific structure is shown as follows (Fig. 1):

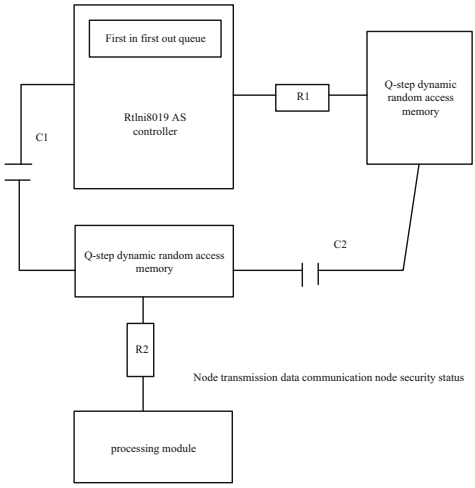

Fig. 1. Data monitoring platform configuration optimization

Using the C/S architecture and the software developed by Power Builder to optimize the functions of the intelligent monitoring platform for the backstage data security of the tourism information promotion platform. Its operating environment is set up to run Oracle and other large databases can be normal professional server, there is enough hard disk space to store monitoring logging. Operating system whichever operating system runs Oracle [14, 15]. Optimize the client environment to properly connect to the database server and have enough space to install the client. The connection bus adopts the first-in, first-out queuing method, and realizes the collection of the data transmitted by the nodes and the safety status data of the monitoring nodes in the monitoring platform of tourism information promotion [16, 17]. In the initial collection of the monitoring platform of tourism information promotion platform, the data collection module transmits the collected data directly to the synchronous RAM of RTL8019AS controller, and sieves the uncollected data. Based on this, the functions of the intelligent monitoring platform for backstage data security of the tourism information promotion platform are standardized as follows (Fig. 2):

Before the SDRAM receives the data, it converts the data transmitted by the node and the security state data of the monitoring node into the data to be tested in a unified format. When the storage capacity of SDRAM reaches one frame, the initial monitoring work is finished immediately. In later monitoring work, the data monitoring module will make prior calls to the data in the SDRAM to improve the monitoring capability of the platform [18–20]. SDRAM inevitably stores the same data in many times, which not only occupies the extra storage space, but also slows down the monitoring efficiency of the platform. To this end, the data monitoring module uses local memory removal to clean up the redundant data. In order to realize the improvement of the structure configuration of the intelligent monitoring platform for tourism information promotion data, the specific structure is shown as follows (Fig. 3):

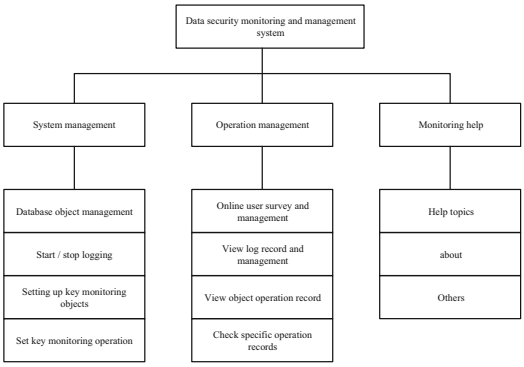

Fig. 2. Functions of backstage data security intelligent monitoring platform of tourism information promotion platform

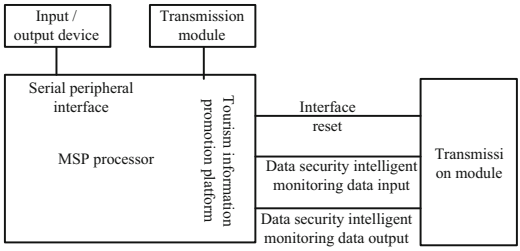

Fig. 3. Structure of intelligent monitoring platform for tourism information promotion data

As shown in the figure, the connection bus based on RTL8019AS controller can not only successfully connect the platform with the tourism information promotion platform, but also connect the data acquisition module with the processing module, and transmit the data to be tested in the data acquisition module to the processing module [21–23]. The external interface of intelligent monitoring platform is the external processing circuit of the data to be tested. Users can choose different processing circuits according to their own needs. The input/output equipment is provided to the platform manager, who can improve the performance of the monitoring platform by controlling the processing flow of the MSP430 processor so as to respond to the updating speed of unsafe factors in the monitoring of the tourism information promotion platform.

2.2 Tourism Information Promotion Platform Background Data Security Intelligent Monitoring Data Collection

Further optimize the methods for collecting the backstage data security intelligent monitoring data of the tourism information promotion platform. The monitoring platform designed for the tourism information promotion platform has data management, monitoring behavior prediction, network management, monitoring management and other functions, all of which are the default basic functions of the platform [24–26]. Based on

this, the data collection module of intelligent monitoring for data security is optimized. The functional structure of the module is shown as follows (Fig. 4):

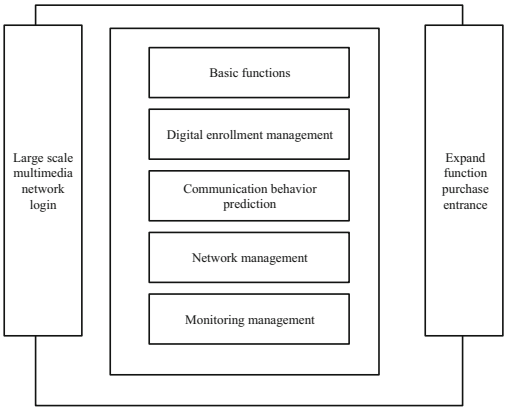

Fig. 4. Data security intelligent monitoring data acquisition module

Monitoring the security of database diagrams Data security intelligence monitoring can be divided into monitoring the connection of users and monitoring the operation of all data objects Data security intelligence monitoring the change of database data and the use of database authority (that is, the use of DML or DDL). Monitoring user connection, every user data security intelligent monitoring connected to the database If you can see its user name, client machine name [27, 28], IP address, running program and other conditions, the data security intelligent monitoring may disconnect the data security intelligent monitoring to prevent illegal access when the DBA deems that the user name, client machine name, IP address or running program is illegal. The DDL and DML rule operations collected from the monitoring were recorded for comparison (Table 1).

Table 1. Operational rules for monitoring data collection

	DDL	DML	GUI	DBA
Real time	High	Secondary	–	Small
Impact on system performance	Small	High	Secondary	Small
Tracking specific objects	–	Small	High	Secondary
System wide monitoring	–	Small	Secondary	High
Accuracy	Small	Secondary	High	Small
Occupied space	Secondary	High	–	Small

The realization of data security intelligent monitoring can provide a reliable and convenient monitoring platform for DBA by providing GUI data security intelligent monitoring for client data security monitoring. According to the different characteristics of the three kinds of monitoring technologies, the intelligent monitoring of data security has realized that the intelligent monitoring of data security can monitor the login user in real time and the operation of database object. However, when there are many objects to be monitored in the database, it is difficult to compile triggers one by one, which will affect the performance of the system. Log analysis can track database changes offline without affecting system performance. Log analysis can monitor specific changes without restoring the entire database. But it cannot get the real-time database change information and data security intelligent monitoring and cannot customize the tracking data items.

The login function of the tourism information promotion platform is the precondition of the basic function of the monitoring platform, that is, the users can use the basic function only when they log in the platform. The function of data management is to manage all the data in the platform by generating reports. Normally, the platform manages the data automatically, but due to the performance limitations of the user terminal, users are also managed manually. The data management feature turns on periodic management reminders for users who choose to manage manually. The function of monitoring behavior prediction can provide users with the security prediction of virtual monitoring behavior of tourism information promotion platform, which can help users better understand which monitoring behaviors will cause monitoring loopholes of tourism information promotion platform by grabbing, filtering and parsing. The network management function inquires and modifies the report forms generated in the data management function, and the user can also inquire the real-time status of the travel information promotion platform. The monitoring management function can query and modify the monitoring data report forms in the data management function, and control the start and stop of the monitoring work of the platform. The monitoring security transmission module of the tourism information promotion platform needs to monitor and transmit the monitoring data (i.e. the processed data to be tested) incorrectly before transmitting the monitoring data to the user terminal, which not only helps to correct the wrong data in the monitoring of the platform, but also provides guarantee for the monitoring security of the platform. The flow chart of intelligent monitoring data transmission, reception and processing is as follows (Fig. 5):

As shown in the figure, when the monitoring platform of tourism information promotion platform monitors the movement of transmitting monitoring data in the processing module, the platform will call the transmission module to intercept and retrieve the data packet. ARP is the address resolution protocol. Each platform monitoring data should contain the corresponding network address, convenient for users to locate the monitoring results. The data with the correct network address is called ARP packet. If the monitoring data transmitted by the platform is an ARP packet, it shall be transmitted directly to the user terminal; if the monitoring data is not an ARP packet, it is necessary to inquire about the parameters of the ARP packet, find out the corresponding network address, input the address into the monitoring data, and form a normal network packet to be transmitted to the user terminal. If the platform is unable to find the network address corresponding

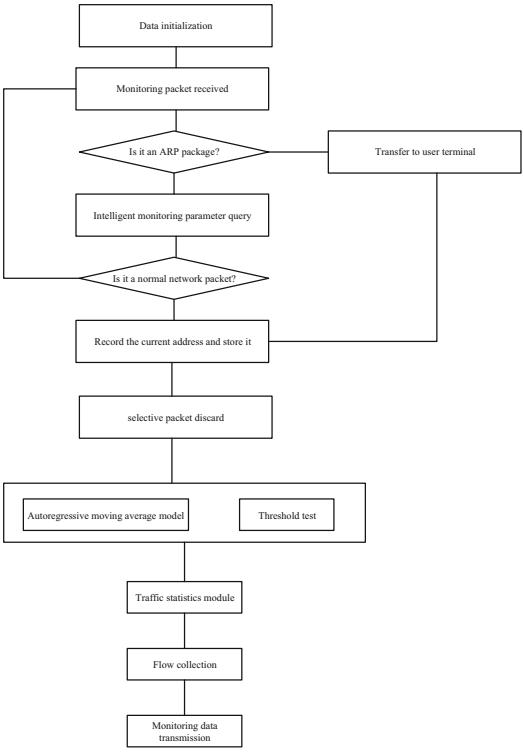

Fig. 5. Intelligent monitoring data transmission, reception and processing flow

to the monitoring data, the monitoring data may be infected by the unsafe data in the monitoring of the tourism information promotion platform, which leads to the loss of some important data and is not effectively monitored by the processing module. Once the current address record of such monitoring data is stored, it is directly discarded. So as to realize the effective monitoring of mass complex tourism information popularization data.

2.3 Realization of Intelligent Data Monitoring of Tourism Promotion Platform

First of all, we need to confirm the application of SaaS Service Data Security Intelligence Monitoring, and then classify the page types in SaaS Service into different categories. Then we use Selenium-driven automatic crawler to monitor the data security in the process of visiting the page to monitor the DOM tree structure of the HTML code after the page is completely rendered, and compute the information needed in the process of constructing the DOM tree. According to the type of the page, different algorithms are used to extract the data part of the page, format the data part, provide the data to the monitor, and transfer the data to the database. The dissemination platform has the following data monitoring methods (Fig. 6):

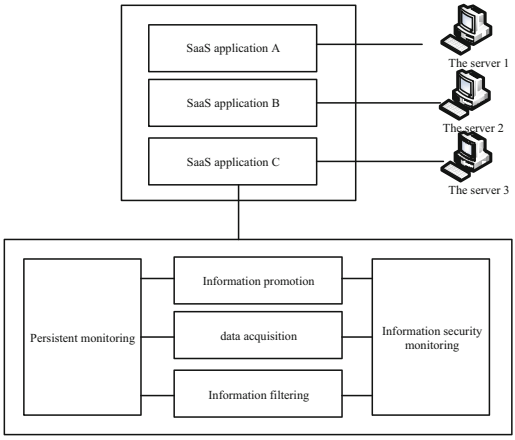

Fig. 6. Popularizing the platform data monitoring data processing method

Classical database security technology Intelligent data security monitoring, such as identity authentication, access control, view, etc., mainly focuses on checking the identity and authority constraints of external users, and intelligent data security monitoring, in order to determine the legality of users or their operations Intelligent data security monitoring identity authentication and access control. Taking prevention as the center of passive security mechanism, data security intelligent monitoring backup recovery restores the data after being invaded and destroyed. Although intrusion monitoring has made great progress, most of these researches are in the network and operating system level and the database itself is a complex structure data security intelligent monitoring data security intelligent monitoring from data storage to data file, table, field to tuple and so on different granularity storage unit. Therefore, the data intelligent monitoring database should have a more active and positive security mechanism to prevent more effective network access to the database to bring endless attacks, based on this platform for tourism data intelligent security monitoring security processing optimization, as follows (Fig. 7).

The concept of database intrusion monitoring has been put forward, which is the same as network intrusion monitoring. Through the intelligent monitoring of the state and activity of the running system, the intelligent monitoring of data security can find out that the intelligent monitoring of intrusion and attempted data security can greatly improve the initiative and automation of database security. Data Security Intelligent Monitoring from the database activity has the activity level Data Security Intelligent Monitoring from the system call layer, the process, the transaction layer, the session layer to the application layer. Moreover, it is very difficult to integrate or exchange the data security intelligent monitoring database with the underlying operating system and network monitoring system. So data security intelligent monitoring database intrusion monitoring cannot go out of the laboratory data security intelligent monitoring to meet today's practical security needs. Database Security Monitoring Data Security Intelligent Monitoring is to use the existing security monitoring technology to monitor the changes of database data and the operations of database users. Data Security Intelligent

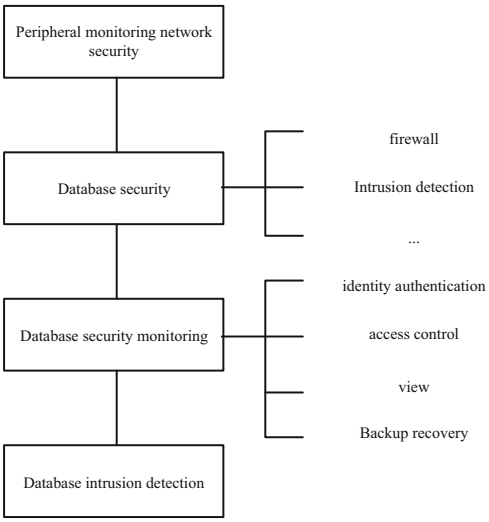

Fig. 7. Data intelligent security monitoring security processing steps optimization of tourism promotion platform

Monitoring can provide a good platform for DBA to actively monitor Data Security Intelligent Monitoring C2 Database Security Intelligent Monitoring to meet the actual security monitoring needs. Furthermore, the data part of HTML format is formatted into normal data format, and the data security intelligent monitoring filters out the useless HTML code data security intelligent monitoring to improve the monitoring accuracy.

3 Analysis of Experimental Results

The monitoring ability and response effect of the monitoring platform of tourism information promotion platform designed in this paper were tested. In order to enhance the persuasiveness of the test results, the sensor security monitoring platform and H235 protocol security monitoring platform are selected to compare with this platform. The purpose of this paper is to test whether the platform can accurately and efficiently monitor the insecurity of the tourism information promotion platform. In the process of testing the monitoring capability of the platform, 5 kinds of unsafe data were given randomly, and 5 unsafe monitoring nodes were placed in the tourism information promotion platform. Using the sensor security monitoring method, H235 protocol security monitoring platform and this method, the monitoring process of the above tourism information promotion platform is monitored for 24 h. The monitoring results of the unsafe data and the monitoring results of the unsafe monitoring nodes are as follows (Table 2):

The above table shows that the sensor safety monitoring method and this method can accurately monitor the unsafe data in the tourism information promotion platform, while the H235 protocol safety monitoring method does not monitor the unsafe data numbered 5. For the monitoring time of the three platforms, the lowest efficiency is sensor safety monitoring, and the highest efficiency is this platform. According to the analysis table,

Table 2. Unsafe monitoring data structure statistics

Unsafe data number	Time consuming (min)		
	Sensor safety monitoring method	H235 protocol security monitoring method	The method of this paper
1	12	10	4
2	14	10	3
3	15	8	3
4	13	8	2
5	16	7	3

the sensor safety monitoring platform and the H235 protocol safety monitoring platform have the phenomenon of missing detection in the monitoring of unsafe nodes in the tourism information promotion platform. For the monitoring time, the H235 protocol security monitoring method has the lowest efficiency and the present method has the highest efficiency. To sum up, the accuracy and efficiency of this method are high, which proves that this method has a good monitoring ability.

The response effect is the foundation of the monitoring platform for tourism information promotion. In the response effect test, the response time of the monitoring data is selected to test the response effect. Response time refers to the time when the platform and the tourism information promotion platform are connected successfully. The smaller and more stable the value is, the better the response effect is. The experiment will control the delay rate of two tourism information promotion platforms with different amount of insecure monitoring data, and use sensor security monitoring platform, H235 protocol security monitoring platform and this platform. First, the three platforms are initialized, and then, under the same conditions, the two tourism information promotion platforms are monitored. The response time of the three platforms is recorded respectively, as shown below (Fig. 8).

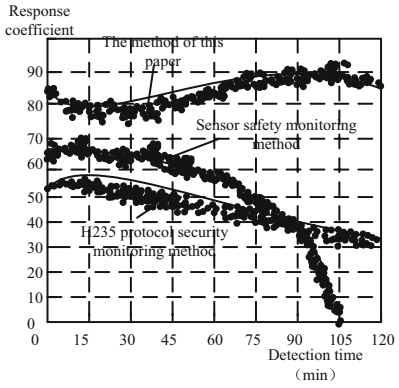

Fig. 8. Data intelligent monitoring response curve

According to the response curve in the graph, the response time curve of H235 protocol security monitoring method and two travel information promotion platforms is the best at the moment of monitoring after the initialization of the platform, but with the lapse of monitoring time, the response time curve of H235 protocol security monitoring method is higher than that of the sensor security monitoring platform and the platform of this paper at the same time, and great fluctuations appear. The response effect of sensor security monitoring method is higher than that of H235 protocol security monitoring method. The response time of this method is short and the fluctuation is not obvious, and the response effect is the best among the three platforms. The results above prove that the background data security intelligent monitoring method of tourism information promotion platform based on cloud computing has better response effect and fully meets the research requirements.

4 Conclusion

Based on the principle of cloud computing, the intelligent monitoring method of background data security of tourism information promotion platform is optimized. The RTL8019AS controller is used to collect the transmission data and security status data of monitoring nodes in the monitoring of tourism information promotion platform, providing the data to be tested in a unified format for the processing module. Safety monitoring of the data to be tested. The experimental results show that the designed platform has strong monitoring ability and good response effect.

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